

AMENDMENT UNDER 37 C.F.R. § 1.114(c)

Application No. 10/049,188

Attorney Docket No. Q63028

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A fuel cell comprising an electrolyte sandwiched by electrodes having a catalyst layer and a gas diffusion layer, or an assembly for a fuel cell comprising an electrolyte sandwiched by electrodes having a catalyst layer and a gas diffusion layer, characterized in that (i) the catalyst layer comprises catalyst bearing conductive powder particles and a graphitized vapor grown carbon fiber having a fiber filament diameter of 10-300 nm, and/or (ii) the gas diffusion layer comprises a layer containing a water repellent resin and a graphitized vapor grown carbon fiber containing boron in an amount of 0.01-10 mass% and having a fiber filament diameter of 10-300 100-300 nm, and wherein at least part of the surface of the gas diffusion layer is in contact with the catalyst layer.

2-16. (canceled).

17. (currently amended): A membrane-electrode assembly for a fuel cell comprising an electrolyte membrane having first and second surfaces, a first electrode on the first surface and a second electrode on the second surface, wherein each electrode includes a catalyst layer and a gas diffusion layer, wherein at least a portion of the surface of the gas diffusion layer which is in contact with the catalyst layer includes a layer containing a hydrophobic resin and a graphitized vapor grown carbon fiber containing boron in an amount of 0.01-10 mass% and having a fiber filament diameter of 10 to 300-100-300 nm.

18. (original): The membrane-electrode assembly for a fuel cell as claimed in claim 17, wherein at least a portion of the surface of the gas diffusion layer which is in contact with the catalyst layer further includes conductive powder particles.

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19. (original): The membrane-electrode assembly for a fuel cell as claimed in claim 17 or 18, wherein at least a portion of the surface of the gas diffusion layer which is in contact with the catalyst layer further includes spaces.

20. (original): The membrane-electrode assembly for a fuel cell as claimed in claim 19, wherein, in a cross section of the gas diffusion layer, the cross section area of spaces having a size of 0.1-50 μm accounts for at least 40% of the total cross section area of all the spaces.

21. (currently amended): A membrane-electrode assembly for a fuel cell comprising an electrode membrane having first and second surfaces, a first electrode on the first surface and a second electrode on the second surface, wherein each electrode includes a catalyst layer and a gas diffusion layer, wherein at least a portion of the surface of the gas diffusion layer which is in contact with the catalyst layer includes a layer containing a hydrophobic resin and a graphitized vapor grown carbon fiber containing boron in an amount of 0.01-10 mass% and having a fiber filament diameter of ~~10-300~~-100-300 nm, wherein at least a portion of the surface of the gas diffusion layer which is in contact with the catalyst layer further includes conductive powder particles and the conductive powder particles are conductive carbon black or conductive carbon powder particles.

22. (currently amended): A membrane-electrode assembly for a fuel cell comprising an electrolyte membrane having first and second surfaces, a first electrode on the first surface and a second electrode on the second surface, wherein each electrode includes a catalyst layer and a gas diffusion layer, wherein at least a portion of the surface of the gas diffusion layer which is in contact with the catalyst layer includes a layer containing a hydrophobic resin and a graphitized vapor grown carbon fiber containing boron in an amount of 0.01-10 mass% and having a fiber filament diameter of ~~10-300~~-100-300 nm, wherein the layer comprising the hydrophobic resin and the vapor grown carbon fiber contains the vapor grown carbon fiber in an amount of 1-95 mass%.

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23. (original): The membrane-electrode assembly for a fuel cell as claimed in claim 22, wherein the vapor grown carbon fiber has been formed through heat treatment at a temperature of at least 2,000°C.

24-25. (canceled).

26. (previously presented): The membrane-electrode assembly for a fuel cell as claimed in claim 22, wherein the vapor grown carbon fiber has a fiber filament length of 100 µm or less.

27. (previously amended): The membrane-electrode assembly for a fuel cell as claimed in claim 17, wherein the hydrophobic resin is a fluorine-based resin.

28. (withdrawn): A process for producing a layer assembly for a fuel cell, comprising a step for forming a gas diffusion layer by applying a conductive porous substrate onto or immersing the conductive porous substrate in a composition comprising conductive powder particles, a hydrophobic resin, and a vapor grown carbon fiber having a fiber filament diameter of 10-300 nm; a step for forming an electrode by forming a catalyst layer comprising catalyst-bearing carbon particles on the surface of the gas diffusion layer, the composition being applied onto the surface of the gas diffusion layer or the gas diffusion layer being immersed in the composition; and a step for bonding the catalyst layer of the electrode to each surface of an electrolyte membrane.

29. (currently amended): A fuel cell comprising a membrane-electrode assembly for a fuel cell comprising an electrolyte membrane having first and second surfaces, a first electrode on the first surface and a second electrode on the second surface, wherein each electrode includes a catalyst layer and a gas diffusion layer, wherein at least a portion of the surface of the gas diffusion layer which is in contact with the catalyst layer includes a layer containing a hydrophobic resin and a graphitized vapor grown carbon fiber containing boron in an amount of 0.01-10 mass % and having a fiber filament diameter of 10-300-100 - 300 nm and separators which sandwich the membrane-electrode assembly.

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30. (previously presented): A fuel battery comprising at least two fuel cells as recited in claim 29, which are layered together.